



METROPOLITAN
TRANSPORTATION
COMMISSION

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Memorandum

TO: Planning Committee

DATE: December 8, 2006

FR: Deputy Executive Director

W. I.

RE: Regional High-Occupancy/Toll (HOT) Lane Network Study Preliminary Results

In Transportation 2030 MTC proposes building on the existing HOV system to create a regional network of HOT lanes by converting existing HOV lanes to HOT lanes and expanding the HOV/HOT system where possible. MTC and Caltrans, in cooperation with partner agencies, are undertaking a Regional High-Occupancy/Toll (HOT) Lanes Feasibility and Implementation Study intended to determine whether a regional network of HOT lanes is feasible, define a phased implementation plan, and provide a regional context for demonstration projects under development. Benefits include more efficient use of freeway capacity and a more reliable and faster travel option. Revenues remaining after operations and maintenance of HOT lanes could be used to expand the HOV/HOT lane network.

The study examined two potential HOT lane networks:

- **Existing and Funded Network** – developed by converting existing HOV lanes, those under construction and those funded in the 2007 Transportation Improvement Program (TIP).
- **Connected Network** – developed by filling gaps in and extending the HOV system.

For this evaluation, tolled vehicles were not permitted to use the HOT lane if volumes exceeded 1,600 vehicles per hour, the volume roughly equivalent to level of service C as required under state law.

Preliminary Findings

Key findings are summarized below and illustrated in the attached slides.

1. **The region's HOV lanes are becoming increasingly crowded over time. Current projections, which reflect the recent economic slowdown and smarter growth principles, suggest this is occurring more slowly than previously assessed in MTC's 2002 HOV Master Plan Update.** HOV lanes projected to approach level of service C by 2020 include: I-80 in Alameda and Contra Costa, I-580, I-680 in Contra Costa, and SR 85. By 2030, HOV lanes on I-880 and US 101 in Marin and Sonoma also will begin to fill. These findings suggest it would be possible to implement a HOT lanes network while allowing 2-person carpools to travel free in many corridors, at least initially. When carpool lanes do begin to fill, the most cost-effective way to address HOV lane crowding in most corridors will be to increase the vehicle occupancy requirement; HOT lanes could maintain freeway efficiency by selling excess capacity in the lanes.
2. **Typical peak period tolls would be in the range of 20 to 60 cents per mile in 2015 and 50 cents to \$1.00 per mile in 2030.** For a 15-mile trip, this equates to \$3 to \$9 in 2015 and \$8 to \$15 in 2030. By way of comparison, current peak period tolls on HOT lanes in San Diego (8.5 miles) and Orange County (10 miles) typically are 50 cents and 85 cents per mile respectively.

3. **Conservative estimates place the capital cost of converting HOV lanes to HOT lanes between \$1.4 and \$3.7 million per mile, depending on the width of the existing, paved right-of-way.**
These estimates assume multiple entries and exits; double-yellow stripe separation between the HOT and general purpose lanes and conform to Caltrans design principles.
4. **Revenues from a HOT lane network developed by converting existing and funded HOV lanes would cover capital and operating costs and may be sufficient to help extend the system; however some corridors are stronger than others.** The Existing and Funded network is estimated to generate net revenue of \$2 to \$4 billion between 2015 and 2045. The cost to extend the network is estimated to be \$3.5 million. Among corridors with the highest net revenue are (see Attachment A):

\$ I-680 over the Sunol Grade*;	\$ I-680 in Contra Costa;
\$ I-580 in Alameda*;	\$ I-880 in Alameda and Santa Clara; and
\$ US 101 in Santa Clara and San Mateo*;	\$ I-80 in Alameda and Contra Costa
\$ SR 85 in Santa Clara*;	

* Being pursued as a demonstration project

Key Policy Considerations

The Commission would need to address several issues in pursuing a regional HOT network.

1. **Governance and revenue allocation.** The region will be able to develop a regional HOT network only if revenues can be applied flexibly throughout the system. Current legislation requires excess revenue be invested within the HOT lane corridors where they are generated.
2. **Tolling policies.** Effective HOT lane operations require a willingness to let the market determine maximum tolls and allow tolls to increase with traffic. Experience with existing facilities suggests this can be done through an open toll-setting process.

A regional HOT lane network could be operated either on a full-time basis or part-time basis. HOT lanes could offer significant travel benefits on weekends and the shoulders of the peak period in some corridors. On some existing HOT lane facilities, travelers have expressed a preference for full-time operation by choosing to use the HOT lane at uncongested times for a low toll. Yet, Bay Area travelers, used to part-time HOV lanes, may view full-time HOT lanes as a take-away.

Effective HOV or HOT lane operations also requires managing the number of vehicles to allow reasonable travel speeds. In many corridors, the most cost-effective means of addressing capacity in HOV and HOT vehicles over time will be to toll 2-person carpools as their numbers increase. The growing number of hybrids eligible to use HOV lanes also threatens successful operations of HOV or HOT lanes, though this will be addressed at a state, rather than local, level.

3. **Equity.** The multiple dimensions of equity (income, geography, modal) will need to be addressed through more detailed analysis to account for specific design, operations and traveler characteristics.

Next Steps

The immediate next steps are to further refine the regional revenue and cost estimates and develop a phased implementation plan outlining the steps to develop a regional network building on the pilot projects currently under development.

Therese McMillan

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Attachment A
Comparison of Revenue and Cost for Existing and Funded
HOT Lane Network, by Corridor

Table 1: Current HOV Requirements

	Revenue/Cost Ratio (Greater than 1.0 means revenues exceed costs)			30 Years of Revenue Minus Costs in Net Present Value (\$s in Millions and Rounded)	
Corridor	Carpool Policy	2015	2030	Low Range	High Range
I-80 ALA-CC	3+	2.3	8.2	\$ 670	\$ 880
I-680 ALA-SC	2+	4.7	13.8	\$ 575	\$ 745
US 101 SM-SC	2+	4.0	7.1	\$ 515	\$ 705
I-880 ALA-SC	2+	5.3	6.4	\$ 365	\$ 500
SR 85 SC	2+	7.3	4.0	\$ 250	\$ 350
I-580 ALA EB only	2+	0.2	4.0	\$ 70	\$ 100
SR 237 SC	2+	0.9	3.3	\$ 55	\$ 85
I-680 CC	2+	1.5	1.9	\$ 5	\$ 40
SR 87 SC	2+	1.0	2.4	\$ 15	\$ 30
I-80 SOL	2+	0.3	1.6	\$ (5)	\$ 5
SR 92 ALA WB, San Mateo Br. Appr.	2+	1.1	1.4	\$ (5)	\$ -
SR 84 ALA WB, Dumbarton Br. Appr.	2+	1.0	0.6	\$ (10)	\$ (5)
I-880 NB, Bay Bridge Appr.	3+	0.1	0.2	\$ (10)	\$ (5)
I-280 SC	2+	0.7	1.4	\$ (20)	\$ (10)
SR 4 CC	2+	0.3	0.7	\$ (50)	\$ (40)
US 101 MAR-SON	2+	0.2	0.4	\$ (155)	\$ (145)
Total Revenue less Costs -- Approximate				\$ 2,265	\$ 3,235

Notes:

Corridors include HOT lanes in both directions unless noted.

Revenue estimates for SR 85 and SR 87 pivot off estimates generated in VTA 2005 study.

Assumes 4% real discount rate.

Attachment A, cont.

Table 2: HOV Requirements Increased in Selected Corridors (Highlighted Rows)

	Revenue/Cost Ratio (Greater than 1.0 means revenues exceed costs)			30 Years of Revenue Minus Costs in Net Present Value (\$s in Millions and Rounded)	
Corridor	Carpool Policy	2015	2030	Low Range	High Range
SR 85 SC	2+	7.3	4.0	\$ 250	\$ 350
I-80 ALA-CC	3+	2.3	8.2	\$ 670	\$ 880
I-680 CC	3+	5.4	10.2	\$ 600	\$ 790
I-680 ALA-SC	2+	4.7	13.8	\$ 575	\$ 745
US 101 SM-SC	2+	4.0	7.1	\$ 515	\$ 705
I-880 ALA-SC	2+	5.3	6.4	\$ 365	\$ 500
I-580 ALA EB only	3+	0.5	8.1	\$ 170	\$ 220
SR 87 SC	2+	1.5	1.9	\$ 5	\$ 40
SR 237 SC	2+	0.9	3.3	\$ 55	\$ 85
I-80 SOL	2+	0.3	1.6	\$ (5)	\$ 5
SR 92 ALA WB, San Mateo Br. Appr.	2+	1.1	1.4	\$ (5)	\$ -
SR 84 ALA WB, Dumbarton Br. Appr.	2+	1.0	0.6	\$ (10)	\$ (5)
I-880 NB, Bay Bridge Appr.	3+	0.1	0.2	\$ (10)	\$ (5)
I-280 SC	2+	0.7	1.4	\$ (20)	\$ (10)
SR 4 CC	2+	0.3	0.7	\$ (50)	\$ (40)
US 101 MAR-SON	2+	0.2	0.4	\$ (155)	\$ (145)
Total Revenue less Costs -- Approximate				\$ 2,950	\$ 4,115

Notes:

Corridors include HOT lanes in both directions unless noted.

HOV occupancy requirement increased in corridors where HOV volumes are forecast to approach level of service C by 2020.

Revenue estimates for SR 85 and SR 87 pivot off estimates generated in VTA 2005 study.

Assumes 4% real discount rate.